# COLONY OF SEYCHELLES

# ANNUAL REPORT

## OF THE

# DEPARTMENT OF AGRICULTURE

## FOR THE YEAR

## 1952.

Printed by Government Printer,
At the Government Printing Office
Victoria, Mahé—Seychelles

COMMONWEALTH MYCOLOGICAL INSTITUTE
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# Annual Report of the Department of Agriculture for the Year, 1952.

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## Policy.

Policy has been fully described in the annual reports for 1950 and 1951, from which it is obvious that the entire wealth of the Colony is derived from agriculture with a two-crop economy: Coconuts and Cinnamon. Any change in the market value of these crops is immediately reflected in the economic life of the islands.

The objectives of policy can be summarised as follows :—

(a) The conservation and improvement, wherever possible, of the natural resources of the islands including forests and water, fisheries, turtle fisheries, and natural deposits of sea-bird guano.

(b) The maintenance of coconut, within its ecological limits, as the most important crop in the economy of the islands, followed by better husbandry of this crop and pest control.

(c) The maintenance of cinnamon as a second crop, but with a better cropping programme than hitherto obtaining. This crop grows wild on the hills of Mahe, Praslin and Silhouette, and the idea that it forms part of the natural scrubland vegetation requiring no attention should be strongly discouraged. Cinnamon should be encouraged on a plantation basis, and natural bush growing amongst plantations should be removed and replaced by cinnamom seedlings so that cinnamon "gardens" may eventually be established.

The cinnamon leaf oil industry is at present under the competitive threat from lignin vanillin, a by-product in the manufacture of paper. The efforts being made to establish cinnamon bark on the world market should be continued in order to maintain a cinnamon industry.

(d) The encouragement of secondary crops in view of the present threat to cinnamon is highly desirable. *Robusta* coffee deserves more encouragement than any other crop, and in case of complete collapse of cinnamon, no better replacement crop could be found. Cocoa is another possible alternative crop, but on a far more restricted basis on account of soil conditions.

(e) The increased cultivation of food crops for local consumption in order to increase the economy of the islands is of primary importance.

(f) The system of farming must gradually evolve towards mixed farming, hence the importance of further development of the animal industry programme.

(g) The badly eroded soils of the lower and middle slopes of the granitic islands must be conserved and their fertility improved. Bench terracing of the lower and middle slopes is considered to be the answer to the proper management of the hillside lateritic soils and their gradual regeneration to a high fertility level.

In a country where criticism levelled at Government has been described as a national sport, I should like to emphasize that the efforts of a paternal Government ends once the opportunity for an agricultural pattern, which has been proved to be sound in practice, has been provided in which the planter can achieve success under guidance. There is no doubt that the emphasis must be laid on the efforts of the planters themselves.

## SECTION I. AGRICULTURE IN THE COLONY.

### *1. Meteorological Conditions.*

Rainfall for the year 1952, recorded at the Port Office, Victoria was 94.13 inches. Though this total precipitation is above the 50 years average, up to 1952, of 90.86 inches, the distribution was most erratic. The Norrth West Monsoon rains which generally start in September failed, and a severe drought was experienced lasting almost to the end of the year. Inter-island distribution varied within wide limits. At Mont d'Or (1300' a. s. l.) on the West Coast of Mahe the rainfall was 97.81 inches while Anse Aux Pins at sea level on the East coast received 96.81 inches of rain. The island of La Digue has on record the lowest rainfall in the granitic group with 59.86 inches for the year. Normally the precipitation during the months September to December is on an average around 42 inches in Victoria, the corresponding figure being only 18 inches for 1952.

The year under review was one of high but most unevenly distributed rainfall, and owing to the dry conditions prevailing, when it should have normally been heavy monsoon rain, outbreak of bush fires in October resulted in the destruction of about 600 acres of land mostly under mixed forest.

The following table records the rainfall and air temperature taken at the Port Office, Victoria, on the main island of Mahe:—

*Rainfall and Air Temperature, Victoria.*

| 1953 Month. | Rainfall Inches. | Air Temperature °F Mean Max. | Mean Min. | Highest Max. | Lowest Min. |
|---|---|---|---|---|---|
| January | 17.83 | 85 | 76 | 87 | 73 |
| February | 14.98 | 85 | 77 | 88 | 73 |
| March | 19.50 | 87 | 78 | 89 | 76 |
| April | 8.93 | 87 | 78 | 90 | 75 |
| May | 5.30 | 88 | 79 | 91 | 77 |
| June | 3.75 | 84 | 77 | 88 | 74 |
| July | 1.86 | 82 | 76 | 84 | 74 |
| August | 3.75 | 81 | 75 | 83 | 73 |
| September | 2.20 | 82 | 76 | 84 | 73 |
| October | 2.53 | 83 | 76 | 86 | 70 |
| November | 4.24 | 84 | 76 | 86 | 73 |
| December | 9.26 | 85 | 76 | 89 | 72 |
| **Total** | 94.13 | — | — | — | — |

## 2. *Coconut Industry.*

The total quantity of copra exported during 1952 amounted to 4,980.750 tons, valued at Rs. 4,074.915. However, as recorded in the 1951 report, 274.091 tons of copra, valued at Rs. 332,562, forming part of the 1951 crop, and which had been received in the copra sheds at the close of 1951, were exported in 1952. On the other hand, 1,504.750 tons of copra, valued at Rs. 1,148,982, forming part of the 1952 crop, had not been shipped at the end of the year and will be carried over in 1953. Thus the total production of copra in 1952 amounted to 6,210.411 tons, valued at Rs. 4,890,335. As is shown in the following table, which records annual production of copra and value over the last three years, production in 1952, though less than in 1951, is still above the figure of 6,000 tons per annum, which may be taken as an average of the Colony's output; the value of the crop, on the other hand, decreased considerably in 1952, due to a sudden fall in market prices:—

| *Year.* | *Production in tons.* | *Value in Rupees.* |
|---|---|---|
| 1950 | 6,500 | 5,229,606 |
| 1951 | 6,574 | 7,435,954 |
| 1952 | 6,210 | 4.890,335 |

The f. o. b. price varied from £50.11 to £76.6 per ton, the local selling price ranged from Rs. 442 to Rs. 676 per ton. Sales were continued on the open market, the early consignments being sold to Kenya and India and the last consignment to Sweden.

A small export of coconuts, totalling 50,000 nuts was shipped to the United Kingdom.

Examination of copra prior to export was continued during the year. Forty-sixty lots were rejected as unfit for export and were returned to the manufacturers for further drying and for cleaning. On the whole the quality of the copra exported was very satisfactory.

The erection of a modern oil mill factory including boiler, steam engine, crusher, coconut oil expeller plant, filter press and storage tanks was started in March and nearly completed by the end of the year. The plant is due to operate early during 1953.

The necessity for such an oil mill has been obvious for many years and the advantages of installing this plant are:—

1. To obtain a higher efficiency in extracting oil from copra at a price which can compete with bullock driven mills of local design. The local wooden mills are very inefficient with an extraction of 50 — 52% as compared with 63 — 64% with modern oil machinery.
2. To obtain a better quality oil filtered under pressure.
3. To obtain a first class coconut cake or poonac. Under the primitive method of extraction in local wooden mills the cake produced contains over 25% of oil and its use is limited as a stockfeed. The modern expeller will produce a cake with an oil content of 7%.

The operation of this plant is bound to have a marked influence on the animal industry programme of the Colony.

### *3. Essential Oils.*

The essential oil industry had a troubled year as a result of the sudden fall in the price of cinnamon leaf oil. The market for Patchouli oil remained weak throughout the year with very little demand at low prices. Cinnamon leaf oil, under competitive threat from lignin vanillin, did not enjoy the high prices of 1951.

#### (a) *Cinnamon Leaf Oil.*

Some 69 tons of cinnamon leaf oil were exported during 1952, compared with the record export of 99 tons in 1951. A deterioration in market conditions and a sharp fall from the boom prices of 1951, were important features of the industry in 1952. By the end of the year there was little demand for the commodity, and a large stock of oil, estimated at about 30 tons, had accumulated on the local market. The local selling price ranged from Rs. 9 to Rs. 15 — per kilo.

Great anxiety is felt concerning the future of the cinnamon leaf oil industry. Seychelles cinnamon leaf oil is used almost exclusively in the manufacture of vanillin, and the development of the lignin industry in the U. S. A. and elsewhere, which provides a cheaper source for vanillin, constitutes a grave threat to that industry.

A representative of the Colony's Sole Selling Agency for cinnamon leaf oil, Mr. Ennever, visited the Colony in November, 1952, and gave an address at a public meeting to planters and distillers of cinnamon on future market prospects in the light of competitive threat from lignin vanillin, a cheap by-product in the manufacture of paper. Mr. Ennever, who is an expert in the eugenol market, strongly advised that in order to maintain the life of the industry, planters and distillers should find means and ways of reducing production cost so as to enable them to compete with cheap lignin. He further advised that the best policy would be to enter into long term contracts in the future with certain vanillin manufacturers at competitive prices. It is hoped that all those interested in the industry will realise the real value of expert advice, and that every effort will be made to cooperate with the Agents, in an endeavour to maintain and extend the life of this most important industry to Seychelles.

The control of the quality of cinnamon leaf oil prior to export, inaugurated at the end of 1950 was continued with very satisfactory results, as only one case of adulteration was detected towards the end of the year.

#### (b) *Patchouli Oil.*

There was a small increase in the export of patchouli oil in 1952. There was little demand for the oil during the larger part of the year, and the prices received were below those of 1951 and were hardly economical. 2,718 kilos of oil were exported and the local selling price was about Rs. 40 per litre.

A small export of dry patchouli leaves totalling 40.567 tons was shipped to U. S. A.

A strict control of the quality of the oil prior to shipment was maintained by regular routine analysis, and no sub-standard oil was detected.

The following table gives export figures and value of cinnamon leaf oil and patchouli oil for the last three years :—

| | 1950 | | 1951 | | 1952 | |
|---|---|---|---|---|---|---|
| | Quantity Kgs. | Value Rs. | Quantity Kgs. | Value Rs. | Quantity Kgs. | Value Rs. |
| Cinnamon Leaf oil | 97,000 | 1,172,679 | 99,332 | 2,211,774 | 69,127 | 1,201,298 |
| Patchouli Oil | 4,816 | 769,919 | 2,286 | 332,299 | 2,718 | 187,318 |

(c) *Cinnamon Bark.*

143 tons of Cinnamon bark were exported in 1952. Although the value of the produce advanced slightly in 1952, limited market and low prices continue to form a stumbling block to that industry. The local selling price ranged from Rs. 260 to Rs. 275 per ton.

Experimental distillation of cinnamon bark oil, with a view to producing an oil of marketable quality, was continued. The type of bark used was scraped bark, 3 to 5 years old. Samples of oil obtained were forwarded to the Imperial Institute for examination and report. The establishment of a Seychelles quality cinnamon bark oil might prove of the utmost importance to the future of the cinnamon industry should lignin-vanillin reveal itself a serious competitor for vanillin manufactured from cinnamon leaf oil.

The following table gives exports figures and value of cinnamon bark for the last three years : —

| 1950 | | 1951 | | 1952 | |
|---|---|---|---|---|---|
| Quantity Tons | Value Rs. | Quantity Tons | Value Rs. | Quantity Tons | Value. Rs. |
| 265 | 76,872 | 207 | 76,275 | 143 | 61,327 |

*4. Vanilla Industry*

The following table records vanilla exports and values for the last three years : —

| Year | Quantity in Kilos. | Value in Rupees. |
|---|---|---|
| 1950 | 770 | 8,987 |
| 1951 | 484 | 7,264 |
| 1952 | 5,927 | 79,550 |

As indicated in the table, the export figure for 1952 shows a considerable improvement on those of 1950 and 1951. This was due to the profuse flowering of the vine during the drought, May—July, 1951, which resulted in a large production of pods in 1952. It is interesting to note here that, following similar conditions in 1945 and 1947, bumper crops were collected in 1946 and 1948. Unfortunately this industry suffers

from a sensitive market and low selling prices, so that large crops often coincide with low market values. The local selling price ranged from Rs. 6.50 to Rs. 7 — per lb. of cured beans.

### 5. *Fishing Industry.*

194 tons of salt fish, valued at Rs. 131,435, were exported in 1952. The following table records the export and value of salt fish over the last three years : —

| Years. | Export in Tons. | Value in Rupees. |
|---|---|---|
| 1950 | 148 | 61,696 |
| 1951 | 142 | 32,415 |
| 1952 | 194 | 131,435 |

A much better price per ton of salt fish was thus obtained in 1952, compared with 1951. However, the scarcity of fish around the coast of Mahe and of the other granitic islands and on the banks in the neighbourhood of the Seychelles, as well as adverse climatic conditions, curtailed production in 1952. It is believed that this scarcity, which has now occured far at least two successive seasons, may be due to some natural cause, such as migration ; it is quite possible that fish population near and around the Seychelles, has its peak and lean years, as this phenomenon has occured in the past. The bulk of the salt fish was exported to East Africa.

The Seychelles Fisheries, established by the Colonial Development Corporation in 1950 for the preparation and export of salt fish to East Africa, closed down in 1952. This was most unfortunate, as the Seychelles Fishries were the first and only enterprise working on a relatively large scale for the exploitation of the extensive fishing banks between the Seychelles and Mauritius. The local industry would have benefited immensely by the technique and facilities provided by this organisation. The catches made by the Corporation's boats during the two years of operation fell below expectations and can be mainly attributed to the scarcity of fish during two poor seasons. High operating costs and other similar factors contributed to the failure of this enterprise.

### 6. *Other Industries.*

The following table gives the export figures and values of the minor industries of the Colony for 1952 : —

| Product. | Quantity. | Value in Rupees. |
|---|---|---|
| Guano | 11,120 tons | 421,190 |
| Calipee | 2,567 kilos | 36,300 |
| Shark fins | 4,570 " | 14,488 |
| Shark Oil | 2,439 " | 7,310 |
| Coco-de-mer nuts | 1,791 nuts | 2,774 |
| Tripangs | 327 kilos | 1 013 |

### 7. *Conditions on Estates.*

It is gratifying to note that more attention was given by planters to the systematic cleaning of coconut groves, and in certain areas to a manuring programme, including the use of all locally available materials such as spent cinnamon leaf, coconuts leaves and husks, and distillery ash. It is rather strange to note that on the Outlying Coral Islands more attention is generally paid to the upkeep and manuring of coconut plantations. Throughout the granitic islands, including the main island of Mahe. coconut cultivation is, unfortunately, in many areas a mixed forestry enterprise.

### 8. *Food Production.*

Though the position in the production of foodstuffs for local consumption is far from being satisfactory, food crop production was on the whole very much better during the year. It is estimated that an increase of 15% on last year's production was achieved. A Vegetable Purchasing Scheme sponsored by Government was started in July, and has helped to bring more vegetables and fruits to the Central Market in Victoria. It is hoped that this scheme will help to close the large gap existing in food crop production. Increased food production provides the best way of lowering the cash cost of a secure living on the land, and active propaganda continued to be undertaken by the Department in the 'grow more food campaign'.

The distribution of graded livestock and stockfeed was continued during the year. The herds of cattle which had been almost depleted during the war years through uncontrolled slaughtering are now building up again, and the time is not far away when the animal industry of the island will be on a sound basis.

### *Pests and Diseases,*

(This section has been written by Mr. E. S. Brown, Entomologist in charge of Melittomma investigation).

#### (a) *Rats*

During a visit to Ile Platte specimens of rats were caught in traps, and it was noticed that two colour-forms were present :—

(i) Upperside dark grey ; underside slightly paler grey.
(ii) Upperside grey with a brownish tinge ; underside white.

There were eight examples of the former and three of the latter. Representative examples were sent to the British Museum, where they were examined by Dr. T. C. S. Morrison-Scott, who reports : "The specimens submitted are *Rattus rattus* and it is not possible to say more. The species occurs in three colour phases : "*rattus*", which is whole dark, nearly black (melanistic) ; "*alexandrinus*", which has the underparts grey and is less black above ; the "*frugivorus*", which has the undeparts white and is less black above. These used to be regarded as subspecies, but can occur in the same litter".

It would appear that the forms found on Platte were "*alexandrinus*" and "*frugivorus*", but that the distinctions could not be expected to involve difference in habit. On Mahe and Praslin, several rats examined were all of the "*alexandrinus*" type. It appears that no rats other than forms of the black rat (*Rattus rattus*) have been certainly indentified from the islands

A further consignment of Cape Barn Owls (*Tyto alba*) has been introduced, and liberated in two batches on Mahe (Niol). The total liberations of the birds up to now are as follows:—

| *Date.* | *Locality.* | *No. of owls liberated.* |
|---|---|---|
| 27th April, 1949. | Ile Platte. | 3 |
| 31st December, 1951. | Mahe, Union Vale | 15 |
| 29th July, 1952. | Mahe, Niol. | 6 |
| 9th August, 1952. | Mahe, Niol. | 6 |

It is difficult to obtain precise information about the progress and activities of these liberated birds. One bird however, almost certainly one of those liberated in July or August, 1952, was seen at Beau Vallon shortly afterwards. It eventually took up a permanent position at the Beau Vallon Hotel, where it roosted in the garage by day and fed in and about the hotel in the evening. The "pellets" of this bird were collected at intervals for some time afterwards ; at first they consisted almost entirely of the remains of cockroaches, but later there was a change and they began to contain the remains of rats. On one occasion the bird was seen to catch and eat a rat. On another occasion an owl was seen to catch a rat at Le Niol.

The Beau Vallon bird left the locality about the beginning of December and has not been seen there since.

There have been various other reports of owls on Mahe, but few are supported by sufficiently precise and reliable evidence.

### (a) *Melittomma Insulare* Fairm

The past year has seen the beginning of a large-scale campaign against this pest.

On February 14th Mr. D. Vesey-Fitzgerald of the International Red Locust Control Service and Mr. E. S. Brown of the Commonwealth Institute of Entomology arrived to carry out a programme of research, and they were joined on February 20th by Dr F. J. Simmonds, of the Commonwealth Institute of Biologiocal Control. Dr. Simmonds left on March 17th with a view to continuing investigations elsewhere into the possibilities of biological control; Mr. Vesey-Fitzgerald stayed until May 14th, while Mr. Brown remained for an indefinite period to continue research in the Colony. On March 10th Mr. J. A. W. Dookley was appointed assistant, and has remained with us ever since.

The first two or three months were largely spent in making a survey of the various islands, to form an idea of the present status of *Melittomma* and to enable Mr. Vesey-Fitzgerald to compare the present situation with what he had found during his previous work on the problem 13 years before. The system adopted was to examine random samples of trees from various plantations and to express the results as percentage of trees infested. The following table shows a comparison of the numbers of recent and earliest samples with infestation of various percentages:—

*Planted and Species Distribution Record (Acres)*

| Forest | Total Acreage | * Balsa (*Ochroma lagopus*) | * Leila (*Melia dubia*) | * Pruneau (*Eugenia species*) | Teak (*Tectona grandis*) | Jak (*Artocarpus communis*) | Cashew (*Anacardium occidentale*) |
|---|---|---|---|---|---|---|---|
| Val Riche and Sans Souci | 231 | 1/10 | — | — | — | — | — |
| Le Niol | 144 | — | $\frac{1}{4}$ | — | $\frac{1}{4}$ acre total for all forests | — | — |
| Grand Anse | $113\frac{1}{2}$ | — | — | $2\frac{1}{4}$ | — | — | — |
| Newcome (Praslin) | $51\frac{3}{4}$ | — | — | — | — | 1/5 | 1 |

Species marked with an Asterisk denote recent introductions for trial. Total No. of trees planted during 1952 596,112.

*Research,*

Several sample plots (1/20th acre) have been established from which it is hoped to gain considerable basic knowledge concerning various species and admixtures. Weed successions are being carefully noted as the influence of the thickening and expanding canopy prevails itself upon ground vegetation, together with individual weed resistance to overhead shade. Girth increment of large trees which have been thinned and cleared of undergrowth in order to be underplanted, is being recorded, both to ascertain what measures of response the trees gives to more space and light and also to form a rough estimate of stem increment to be expected from plantations of approximately the same age on similar sites.

The spacing which has now been generally adopted varies between 6 feet and 7 feet as this has been found to give the most satisfactory results to date.

The treatment of plantations remains unchanged as from 1951 report.

*Pests.*

Snails continue to be a great nuisance, doing considerable damage especially to introduced species, in particular, *Cedrella maxicana* which is girdled very quickly. Soot and sawdust have been place around these trees and were reasonably successful until heavy rains occurred, after which they had little effect. Metaldehyde snail poison is beyond doubt the most effective control but its rather high cost and the impractibility of complete plantation protection preclude it from general use. It is being used to protect some of the more vulnerable introductions, however, as it is felt that the cost involved will be more than justified if it results in the successful introduction of a valuable exotic.

The number of Tung rats appear to have been considarably reduced in most areas and their depredations are noticeably less. It may be of course that the direct sowing experiments undertaken last year proved to be a decidedly added attraction to the forest areas, and that upon the cessation of these "free meals" the tung rats have not frequented the plantations in such large numbers.

*Forest Offences.*

During the year 5 persons were charged for committing forest offences. Of these, three received sentences of imprisonment and two were bound over.

*Fire.*

1952 proved to be a bad year in general for fires.

The drought which set in during mid September had by early October reduced the countryside to a very dry and dangerous condition, which brought about a series of fires over a wide-spread area. Indeed between the 3/10/52 and 17/10/52 no less than nine bush fires occurred and an estimated total area of 600 acres were burned.

This period proved a trying one for the Forestry Division and frequently the Rangers and Staff were fighting fires throughout the 24 hours. Happily, none of the forest suffered any damage, though on two occasions

Some preliminary experiments have also been carried out with systemic insecticides, which are carried up the trunk in the sap-stream. Poor results have been obtained with *parathion*, the only one used so far. Other more promising systemics have been obtained

The historic methods of tarring and burning have been tried for comparison with other methods; it need only be stated here that they proved far less satisfactory than the new insecticide technique.

In the middle of November Mr. Brown left for Madagascar to study *Melittomma* there, the only other place apart from Seychelles in which *M. insulare* occurs. He spents three weeks there, returning to Seychelles on December 19th. Some valuable information of an ecological and cultural nature was obtained.

Dr. Simmonds' researches into the matter of biological control for *Melittomma* have hirtherto been unsuccessful. Recently, however, in Trinidad, he has found infestations in mango trees of *Atractocerus brasiliensis*, a beetle closely related to *Melittomma* and with similar larval habits. He is now occupied in looking for parasites of *Atractocerus* which might be tried out against *melittomma*. He has also found a Nitidulid beetle in Great Britain which preys upon the eggs of wood-boring beetles, and this may be tried out against *Melittomma*.

### (*c*) *Oryctes monoceros* Ol.

A short visit to La Digue on March 6th failed to reveal any sign of *Scolia ruficornis* which were liberated there in November, 1951. It is hoped to pay a longer visit in the near future to search more throughly.

A secondary object of a visit to Madagascar by Mr. Brown in November and December was to collect and bring back some *Scolia oryctophaga*, to prey upon *Oryctes*. Unfortunately none were found, but the French authorities have kindly promised to send a consignement if and when opportunity occurs.

### (*d*) *Cosmopolites sordidus* Gem.

In February, about 216 adult *Leinota quadritentata*, and about 295 adult *Leinota columbiana* were liberated at Mamelles, Mahe, in a banana plantation infected with *Cosmopolites sordidus*. The insects were introduced by air from Trinidad by Dr. F. J. Simmonds when he visited the Colony in February. They were packed in a wooden box containing dampen moss and wood shavings, and arrived in excellent condition. Few deaths occured during the voyage, and the insects were very active when liberated.

## SECTION II. WORK OF THE DEPARTMENT.

## 1, Veterinary and Animal Husbandary Division.

### *Introduction.*

The duties of the Division were mainly advisory work to stock owners, supervision of the maintenance of Government Dairy and livestock centres, poultry development programme, distribution of stockfeed, slaughtering of animals, green turtle industry and control of diseases in livestock. The training of local personnel in Veterinary and Animal Husbandry was

continued. The Veterinary and Livestock section at the Agricultural Show was organised, where privately owned livestock were exhibited along with Government owned livestock. The show afforded an excellent opportunity of meeting and talking with many stock owners about problems relative to Animal Husbandry.

## A. ANIMAL HUSBANDARY.

### 1. Government Dairy, Union Vale.

*(a) Herd Strength.*

The herd consisted of Friesian, Sindhi, local and cross (Sindhi and Friesian) cattle. The strength of the herd at the end of the year was as follows: —

| Breed | Bulls. | Cows. | Heifer Calves. | Bull Calves. | Total. |
|---|---|---|---|---|---|
| Friesian | 1 | 66 | 8 | 2 | 77 |
| Sindhis | 4 | 3 | 1 | — | 8 |
| Cross (F & S) | — | 3 | 17 | — | 20 |
| Local | — | 9 | — | — | 9 |
| Jersey | — | 2 | 1 | 1 | 4 |
| Total ... ... | 5 | 83 | 27 | 3 | 118 |

The stock remained healthy, in spite of an outbreak of cow pox. Tick infestation was controlled by forthnightly dippings. The dip was emptied during the year and filled with dipping solution of forthnightly dipping strength.

*(b) Milk Yields.*

The details of milk yields are giving below: —

| | |
|---|---|
| Total milk produced during the year: | 219,261 pints. |
| Total sales to public: | 181,427 ,, |
| Total fed to young stock: | 37,834 ,, |
| Average production of milk per day | 599 ,, |
| Average number of cows in milk: | 60 ,, |
| Average production per cow during the year: | 3,654 pints. |
| Average daily production per cow: | 10 ,, |

(c) *Milk Records.*

The production and progeny records of cows were maintained, and history sheets for individual cows were completed. The highest individual yields from Friesian, Sindhi, and cross cows which completed lactations during the year, are given below.

| Name of the cow. | Breed. | Milk yield in pints. | Days in milk. | Daily average |
|---|---|---|---|---|
| Francine. | Friesian | 5,848 | 319 | 18 pints |
| Juliette. | Sindhi | 1,753 | 250 | 7 ,, |
| Rousse. | Cross (S. & F) | 3,770 | 375 | 10 ,, |

(d) *Breeding Policy and future extension :*

The usual breeding policy of crossing Sindhi with Friesians, breeding of Sindhi cattle and upgrading of local cattle with Friesian or Sindhi bulls was continued. The crossing back of cross (Sindhi and Friesian) cows, either with pure Friesian or Sindhi bulls was started, with a view to observe and compare the performance of the progeny with either pure bred cows or cross cows (S & F).

23 cross heifer calves born of Grade A & B cows were reserved for effecting future replacements.

36 cross heifer calves born of Grade A & B cows in the year 1950 — 1951, stationed on various Government estates, appear to be very promising and should in years to come, enhance the milk production in the Colony.

(e) *Young Stock :*

Of the 70 calves born during the year, 45 were females and 25 were males. 1 bull and 2 heifers were sold and the remaining were transferred to St. Anne Estate for rearing. The practice of weaning calves at birth and earmarking by Danish system were continued.

(f) *Sale of Animals :*

Unprofitable adults and young stock were weeded out and accordingly 6 cows, 2 bulls, 36 young stock were sold by public auction.

(g) *Additions to the Herd :*

19 Friesian heifers in calf were imported during the year from East Africa.

(h) *Sale of Milk and Milk Products :*

Of the 219,961 pints of milk, 181,427 pints were sold to 300 families, hospital and other Government Institutions. Most of the milk was sold after cooling and bottling and the rest used for making cream and butter. The feeding of 3 to 6 month old calves partly with separated and whole milk, helped considerably towards the production of cream and butter. during the year, 76 pints of cream and 54 lbs. of butter were sold to the public.

*Farm Activities.*

These activities are detailed under a report from the Development Officer, Grand'Anse Estates.

2. *Cattle on other Estates :*

Cattle were stationed at various estates for milk, breeding and manurial purposes. The herd strength on each estate was as shown hereunder :—

| | | |
|---|---|---|
| St. Anne Island | ..... | 61 heads |
| West Grand'Anse Estates | ..... | 99 ,, |
| Curieuse Island | ..... | 7 ,, |

The stock on the estates was weeded out and replaced by better animals. The St. Anne Island and West Grand'Anse Estates were used as dry farms and for rearing cross heifer calves from the Union Vale Dairy. A Sindhi herd of 26 head, at Grand'Anse Estates, served as a seed farm for supplying young Sindhi stock to livestock breeders. 29,267 pints of milk were produced on West Grand'Anse Estates, of which, 5,398 pints were supplied to Children's creches, and as ration to the farm staff, 11,713 pints were supplied to the Hospital and public and 12,156 pints were fed to young stock. Fortnightly dippings were carried out to control tick. The dip at Anse Boileau was emptied, and filled with fresh dipping solution of a fortnightly dipping strength. Sindhi and Friesian bulls continued to be stationed on West Grand'Anse Estates for services to the privately owned cows.

3. *Bull-Stations*

Four Sindhi and two Friesian bulls were stationed at six important livestock centres and 160 privately owned cows were served. Bull units were also opened at Praslin and La Digue. It is proposed to increase the number of bull units, no sooner the Sindhi bulls on Grand'Anse Estates reach the breeding age.

4. *Poultry.*

Poultry breeding was carried out at two centres, from which Rhode Island Reds and hatching eggs were sold. The policy of breeding Rhode Island Reds and crossing local hens with Rhode Island Red cockerels was continued. The number of birds at the two centres was as shown below :—

| *Breed.* | *Laying Hens.* | *Cockerels.* | *Pullets.* | *Young Stock.* | *Total* |
|---|---|---|---|---|---|
| R. I. R. | 55 | 9 | — | 10 | 74 |
| Crosses | 14 | — | — | — | 14 |
| Local | 41 | 2 | — | — | 43 |
| Total | 110 | 11 | — | 10 | 131 |

80 birds were sold to the public. 7,635 eggs were obtained, of which 2,046 were sold for hatching, 4,830 supplied to hospital and other instructions, and 602 eggs were incubated. The training of local personel in Poultry Husbandry was continued.

### 5. *Pigs.*

The breeding of large whites, black and cross was continued on St. Anne, Curieuse and Anse Boileau Estates. The stock at the end of the year consisted of the following :—

| *Breed.* | *Boars.* | *Sows.* | *Gilts.* | *Piglets above 2 mths.* | *Piglets under 2 mths.* | *Total* |
|---|---|---|---|---|---|---|
| Large White | 9 | 26 | 18 | 39 | 20 | 113 |
| Black | 1 | 3 | 1 | — | — | 5 |
| Crosses | 1 | — | 1 | 4 | 18 | 24 |
| Total | 11 | 29 | 20 | 43 | 38 | 142 |

34 sows farrowed to produce 235 piglets of which 203 were weaned. 116 piglets were sold for breeding and slaughter purposes. In addition a large white boar, 3 sows and 8 gilts were sold to enthusiastic breeders at concession prices.

### 6. *Beef.*

Beef supplies continued to be in short supply. 414 head (cows 60 and bulls 354) were slaughtered during the year. Two prosecutions of unauthorised slaughter were undertaken by the Police Department.

### 7. *Green Turtle Industry.*

The green turtle fishery was continued on the Aldabra, with a view to provide fresh turtle meat to the population in Mahe. 274 turtles were received during the year and the mortality during voyage was below 10%. The mortality in the turtle pond at Mahe was insignificant. The slaughtering and sale of turtle meat with fat was carried out under the supervision of the Department and by local bodies elsewhere, which system had to be abandoned owing to a decrease in the revenue and the auction of turtles ex-pond was restarted. The revenue on account of Turtle Industry amounted to Rs. 38,000.

### 8. *Stockfeed.*

Owing to a short supply of stockfeed, 2,796 bags of bran were imported from East Africa. Further importations of stockfeed had to be stopped, as the response from stock owners towards the purchase of bran was not satisfactory. Eventually the imported stockfeed was used for feeding livestock on Government Estates, which caused considerable expenditure on livestock feeding.

## *B. ANIMAL HEALTH*

*Veterinary Station :* The Veterinary Station at Union Vale Estate was well equipped with medicines and instruments. The response from stock-owners towards veterinary services was encouraging. In many cases, work of general practical nature had to be undertaken amidst other important duties. Visits in connection with Animal (Diseases and Importations) Ordinance had to be made mainly to inspect animals on ships. 390 clinical examinations and treatments of various classes of animals were carried out. The diseases were of digestive, reproductive and parasitic origin. In addition 60 castrations by Burdizoos method, 125 castrations by open method, ovariotomy in a cat and six minor operations on dogs and cats were performed.

*Diseases of Livestock :* There were no major outbreaks of infectious diseases among livestock population. The health of Government owned livestock has been maintained at a satisfactory level.

## *C. REVIEW OF DISEASES*

(a) *Cow Pox :* An outbreak of cow pox occurred among 6 imported Friesian heifers. In spite of prompt isolation and disinfection measures, 9 cows were affected, causing decrease in milk production. All affected animals were removed to quarantine station and subjected to preventive and therapeutic treatment. No secondary ill-effects were observed and the cows recovered after a fortnight. Regular inspection of udder, daily recording of temperature of cows, and vaccination of newly imported heifers with calf lymph were started to check furtherence of disease. The disease appears to be a localised enzootic and some more cases were recorded during the year.

Dried scabs were sent to Veterinary Laboratories, Kabete, for preparing a vaccine. It is proposed to resort to annual vaccinations against cowpox at the Government Dairy.

(b) *Piroplasmosis (Red Water)* : A Friesian heifer and a local cow on St. Anne Island died after showing symptoms of high fever, shivering and characteristic change in the colour of the urine. Blood smear examination of animals showing high temperature was carried out and the causative organisms were less readily found. Five suspected cases responded to treatment with "Badesan". As a preventive measure, weekly dippings and recording of daily temperature of all animals were undertaken. No further cases were detected later during the year.

(c) *Abortion*: Five imported pregnant Friesan heifers aborted at the quarantine station, and their serum was subjected to agglutination tests with negative results. The abortions were believed to be due to strenuous journey on rough seas. No abortions were recorded afterwards.

(d) *Fowl Pox :* There were numerous outbreaks of Fowlpox causing heavy losses particularly among chickens. Segragatory and prophylactic measures combined with the vaccination of the healthy birds were carried out. 482 birds were vaccinated and the method of vaccination was demonstrated to several farmers.

(e) *Coccidiosis :* The disease was detected amongst chickens at the Central Poultry Farm and thirty deaths were recorded. Hygienic measures combined with Sulphamethazine teatment and feeding of butter milk helped to check the spread of the disease.

(f) *Fowl Typhoid :* Six imported Rhode Islands Red hens died after showing symptoms of unthriftiness and emaciation. On post mortem, lesions typical of Fowl Typhoid were observed and organ smears were examined to eliminate other diseases. Further spread of the disease was checked by isolation and disinfection measure. It is proposed to vaccinate the flock, no sooner the vaccine is received from Veterinary Laboratories Kebete.

(g) *Eye-worm :* Eye-worms in chickens were found to be highly prevalent. Preventive and therapeutic measures were advised.

(h) Poisoning of fowls by eating decomposing animals tissues appear to be increasing. Surgical removal of crop-contents and feeding of animal proteins were adopted.

(i) Scaly legs and parasitic infestation in fowls were detected and control measures were adopted.

(j) Itching condition in pigs was effectively controlled.

(k) Helminthic infestations were detected in all classes of livestock. A check list of helminths affecting livestock in Seychelles is under progress and shall be published when completed. Control and curative measures to check the spread of internal parasites were carried out.

(l) 197 smears, 16 faecal samples, 2 milk samples and 3 other specimen were examined for diagnostic purposes. 22 serum samples were subjected to agglutination tests for Brucella-infection. One biological test and 22 post-mortems were performed.

*Quarantine Station.*

The quarantine stations on Hodoul and Long Islands were maintained and inspected every two months.

*Import of Animals.*

19 Friesian heifers, 7 Indian peacocks, 14 barn owls, 14 canaries, one mouse bird, one bulbul, one hooded finch, one tortoise and a dog were imported during the year and were quaranntined for periods required under Animal (Diseases and Importations) Ordinance of 1950. Frequent spraying of cattle and gammexane dusting of birds were carried out. Blood smear examinations on alternate days have been negative.

*Export of Animals.*

The following exports were effected during the year :—

18 land tortoises (Testudo elephantina)
1 Siamese cat.

DR. D. K. DESAI,
Veterinary Officer.

## 2. Forestry Division.

*Progress.*

By the close of the year the total acreage planted had risen from 314 acres to 854 acres, giving a figure of 540 acres for the planting programme completed during 1952.

The above acreage would normally have been exceeded but for the temporary closing down of re-afforestation operations in Praslin half way through the year, coupled with adverse climatic conditions which occurred during the S. E. Monsoon.

Due to unforeseen circumstances, the Forest Ranger from Praslin was seconded to the Agricultural Department Laboratory from June onwards. Thus Newcome Forest had to be placed on a "care and maintenance" basis. A skeleton staff was maintained to be responsible for beating up, weeding and maintaining the planted area in general until such time as normal work may be resumed. This arrangement has considerably curtailed the projected planting programme for this forest during 1952.

During September and October an almost unbroken drought prevailed which badly retarded planting over that period, and though some rain did fall during November and December, rainfall records show that the total rainfall from September onwards has been very much below average for the time of the year.

By October, conditions were so dry that bush fires became a menace and within the period 3/10/32 — 17/10/52, no less than nine separate outbreaks occurred. In one area, five outbreaks were fought within a single day. During the acute fire danger period, forest work was almost at a standstill, and for a considerable period afterwards, labourers had to be deployed from their normal task to act as patrolmen until it was considered safe to cease patrols and resume the normal work routine.

Labour was generally more plentiful during 1952, but is still short of requirements, especially male labour. The standard of fieldwork is, however, improving.

*Sylviculture.*

Of the earliest plantations established (i.e., established during the first six months of the scheme), approximately 60% have closed their canopy — the time taken to do this varying from 17 months — 2 years according to species and quality of site. It is significant to note that the rate of growth falls off considerably where trees have been planted on abandoned cassava plots sited on sloping ground — here the inevitable results of shifting cultivation and lack of erosion measures are very evident, especially when one compares the rate of growth of these trees with those planted on similar terrain but in more or less virgin soil.

However, growth though slower on these sites, is steady and there is little fear at present that these areas will not eventually close canopy and produce an adequate soil cover and a profitable return.

The general condition of the forests is very encouraging and as a whole shows great promise.

Of the species planted, *Albizzia molucanna* maintains the lead as the fastest growing species, but is closely followed in height growth on suitable soils by Santol (*Sandoricum indicum*), Badamier (*Terminalia catappa* , Cedar (*Casuarina equisetifolia*), and Teak (*Tectona grandis*). It would appear from present observations that Sangdragon (*Pterocarpus indicus)* will probably, upon becoming well established, compare with, or even lead Albizzia, there being isolated examples of early established Sangdragon cuttings giving leading shoots exceeding 22 ft. in one year.

Agati (*Adenanthera pavonina*), Takamaka (*Calophyllum inophyllum*) and Jak *(Artocarpus communis*) are the faster of moderately growing species, followed by Calice du Pape (*Tecoma Leucoxylon)*, Bois Noir (*Albizzia lebbeck)* and Gayac (*Intsia bijuga)* in that order. Bois de table (*Heritiera littoralis*), as may be expected from such fine timber, is the slowest growing species.

It has been observed that the hardiest species encountered so far are Takamaka, Calice du Pape, Agati and Cashew. The first three may be relied upon to give reasonably satisfactory results on rather poor soils, while Cashew will grow on even poorer sites, but does not produce anything more than soil cover, on such sites, its stem form being very forked and crown spreading.

Where the soil is too badly eroded, the only species which would appear to offer any hope of a reasonably early soil cover, is Coco-Plum (*Chrysobalanus icaco).* This is being tried extensively as a pilot species on the bare hill tops of Newcome, Praslin, in order to ascertain whether it may be used on a much wider scale later for planting up many of the badly eroded areas in Praslin and Curieuse.

Of the recently introduced species there would appear to be one or two outstandingly fast growers, which, it seems likely, will equal if not surpass a large proportion of the indigenous and earlier introduced species mentioned above. Central America Cedar, (*Cedrella odorata)* has shown remarkable growth on choice sites as also has Mahogany (*Swietenia mahagoni*). This latter species has, rather suprisingly, given to-date good results on soil in which indigenous species have shown poor growth. Other introduced species which have germinated well and give at present every reason to expect good results from are *Cedrella mexicana, Swietenia macrophylla, Ochroma lagopus* and *Cinnamomum camphora.*

During the year, two other earlier introduced species were located. They were *Cedrella toona* and *Melia dubia*. The Cedrella was located by reference to an early report by Mr. Dupont (1908), a former Curator of Botonical Gardens, and comprises a single specimen. *Melia dubia* is of unknown origin but is more numerous. Both species have obtained very fine proportions. One of the Melia's, if the age information given is correct, is about 15 years old, has an eight feet girth at B. H. and measures approximately 40 feet in height before giving its first branches. It is regenerating itself profusely and a large number of seeds have been gathered for experimental plantings. It is hoped that this species will prove suitable for inclusion into the planting programme in due course especially in view of its purported resistance to the attacks of white ants.

The *Cedrella toona* also carried seeds, but those gathered have proved to be infertile.

It is rather interesting to note that several members of the Meliaceae family, to which both the above species belong, have in the past and recently, been introduced into this Colony and all appear when planted on suitable sites, to do well. Representatives of this family at present being planted or undergoing trial are : —

Swietenia — Mahagoni and Macrophylla.
Cedrella — Mexicana, and Odorata.
Melia dubia.
Chukrassia tabularis.

The progress of the newly introduced members of the Meliaceae family will be watched with interest, especially with the knowledge that three of the above mentioned species i. e., Mahogany, *Melia dubia*, and *Cedrella toona* have already grown to maturity in these islands and have each produced splendid specimens.

*Cryptomeria japonica* and *Juniperus bermudiana* have been the only two conifers introduced recently. Of these, Cryptomeria germinated fairly well and the progress of the ensuing seedlings is satisfactory, the best having grown a little under an inch per month since germination. Juniperus germinated very badly and only after nine month in the seed bed The very few seedlings obtained appear to be healthy, but growth is very slow.

A large selection of coniferous seed with which to conduct field trials is expected in 1953.

Towards the close of 1952 a further selection of seeds from nine species were received from Ceylon and India. Most of these have germinated well, but it is too early yet to reach any definite conclusions regarding their future The complete list of introductions for 1952 is as follows : —

| | |
|---|---|
| Mauritius : | Cinnamomum camphora. |
| | Agathis robusta (failed to germinate). |
| Jamaica : | Ochroma lagopus. |
| Japan : | Cryptomeria japonica. |
| Trinidad : | Cedrella mexicana. |
| | Swietenia macrophylla. |
| Bermuda : | Juniperus bermudiana. |
| Ceylon : | Berrya cordifolia (failed to germinate) |
| | Chukrassia tabularis. |

India : Dalbergis sissoo.
Terminalia arjuna.
Acrocarpus fraxinifolius.
Adina cordifolia.
Albizzia lucida.
Albizzia procera.
Albizzia stipulata.

It is felt that the unique climate of Seychelles may well lend itself to the successful introduction of many other valuable species and it is hoped that in the course of time, a suitable selection of species will be compiled, from which the optimum return in revenue and utility will be gained.

The method of introduction for trial of the various introduced species is to mix them thinly on suitable trial sites at a ratio of 1 introduced species to 3 — 5 indigenous species — (with indigenous which may reasonably be relied upon to grow.) Thus in the event of a failure, the area will not need replanting except perhaps a beating up, whilst if the introduced species prove a success, the indigenous trees may be thinned as required so as to be allow unchecked progress by the trial species.

*Planting and Species Distribution Record (Acres)*

| Forest. | Total Acreage. | Agati (*Adewanthera Pavonina*) | Takamaka (*Calpohyllum inophyllum*) | Albizzia (*Molucanna*) | Sandragon (*Pterocarpus indicus*) | Badamier (*Terminalia catappa*) | Santol (*Sandoricum indicum*) | Bois de Table (*Heritiera littoralis*) |
|---|---|---|---|---|---|---|---|---|
| Val Riche and Sans Souci | 231 | 57¾ | 58¼ | 9½ | 47½ | 35½ | 16½ | 2¾ |
| Le Niol | 144 | 63 | 19½ | | 13¾ | 14 | 26½ | — |
| Grand Anse | 113½ | 38¾ | 13¼ | — | 34 | 12¾ | 6 | 1¼ |
| Nêwcome (Praslin) | 51¼ | 12½ | 16½ | ½ | ½ | 20½ | — | .1/10 |

| Forest. | Total Acreage. | Calice du Pape (*Tecoma leucoxylon*) | Breadfruit (*Artocarpus incisa*) | * Central American Cedar (*Cedrella odorata*) | * Mahogany *Swietenia mahogani*) | * Large leafed Mahogany (*Swietenia macrophylla*) | * Mexican Cedar (*Cedrella mexicana*) | (*Gmelina aborea*) |
|---|---|---|---|---|---|---|---|---|
| Val Riche and Sans Souci | 231 | | | ¾ | ½ | 1/6 | ½ | 1/24 |
| Le Niol | 144 | 5 | 2 | 1 10 | 1/12 | — | — | — |
| Grand Anse | 113½ | 8¼ | | ¼ | ¼ | ⅛ | 1¼ | — |
| Newcome (Praslin) | 51¾ | | | | | | | |

| *Date.* | *Percentage of Palms attacked.* | | | | |
|---|---|---|---|---|---|
| | 0% | 1—25% | 26—50% | 51—75% | 76—100% |
| 1939 | 4 | 2 | 8 | 14 | 14 |
| (42 samples) | 9.5% | 4.7% | 19.0% | 33.3% | 33.3% |
| 1952 | 3 | 11 | 4 | 11 | 10 |
| (39 samples) | 7.7% | 28.2% | 10.2% | 28.2% | 25.6% |

The results indicate that there has been no significant increase, but if anything a slight decrease in the over-all rate of infestation. This, however, should give no cause for complacency, because the fact remains that there are large areas, particularly on Praslin, where infestation is very high and threatens to reduce coconut production below profitable limit, if active steps are not taken as soon as possible. The number of trees falling annually (chiefly at the start of the S. E. Monsoon) is very high is some places. In one area of 350 acres about 150 trees fall every year ; in another area of 42 acres as many as 18 trees, and in another of about 3 acres 6 trees have been known to fall at the start of the monsoon apart from others which fall at intervals through the year. On Mahe, the condition is much less serious and more local.

An ecological aspect of the problem was studied during the earlier period of general survey ; this is the question of soil types and other conditions in which the most severe attacks are found. This work has been continued ever since, and is important, since it may point the way toward long-term cultural policies, designed to decrease intensity of infestation.

As far as soil types are concerned, present investigations have largely confirmed Mr. Vesey-Fitzgerald's earlier conclusions. (i) *Coral Sand* flats have usually a low rate of infestation, and *Melittomma* may even be absent altogether. (2) *Alluvial soils* (including marsh areas) are usually more or less heavily infested. (3) *Sedentary soils* on hillsides and ridges are infested to a very variable extent, depending largely on degree of erosion, and soil moisture content.

It has proved difficult to correlate high incidence of *Melittomma* with particular ecological conditions, for one always finds exceptions to general rules. This is as true of soil types as of other conditions, and indicates that there are probably several distinct factors which contribute to a build-up of large numbers of *Melittomma*. There is one condition, however, which has been found to be associated with heavy infestation more consistently than any other. This is a soft sappy condition of the wood in the trunk of the palm ; in such a trunk one tends to get larger numbers of larvae than in drier and harder wood. Any factors, therefore, which contribute to such a condition may be expected to lead up to a heavy infestation.

A certain amount of research has been carried out on the *feeding habits* of larvae of *Melittomma*. In the alimentary canal no definite signs of wood have been found, but as a rule only a brownish or yellowish fluid. This suggests that only the sap is used as food. The sap taken by the larvae, however, is in a very modified condition. Around the tunnels occupied by the larvae the wood is discoloured, usually yellowish but sometimes pinkish in colour, especially, in young trees, very wet and full of sap, and having a peculiar smell suggesting a kind of fermentation. This fermented wood sometimes extends several inches into the trunk in advance of the larval tunnels, especially, in young, sappy trees, and certain bacteria appear to play a part in the production of this condition.

because cultures can nearly always be obtained on agar from the juice of such wood. More work is required on this aspect of the problem, but it is safe to conclude that the larva depends mainly for food on the juice in such fermented wood. If this interpretation is correct, it would explain why the larvae fare much better in the soft, sappy wood of young trees, where bacterial fermentation can proceed much more readily than in the dry and hard, more heavily lignified wood of old trees, or trees growing in dry soil.

*Cultural methods* are undoubtedly of great importance in an indirect way in combatting the *melittomma* problem. "Earthing up" is perhaps the best known of those; its value lies principally in enabling a tree to recuperate from pest attack, by encouraging the growth of fresh roots to replace those which have been put out of action by the larvæ. Experiments have been carried out to produce and observe this root-production, and some striking illustrations have been studied of the beneficial effect of the earthing up practice. It is often suggested that earthing up also protects a tree against future attack, but this is by no means certain, and experiments have been carried out which show that larvæ already in the trunk are not killed by the process.

This leads us to the question of *insecticide treatment*, on which most of the research in Seychelles has been concentrated. After unpromising preliminary experiments during the first three months, it was found that a high proportion of the larvæ in a tree could be killed by insecticide, treatment. The insecticides used were *paradichlorobenzene*, *aldrex*, *dieldrex* *agrocide* and *gammalin* (the last two being benzene hexachloride preparations). The most successful of these were the first three, which have a strong fumigant action. With *paradichlorobenzene* high percentages were found to be killed two months or more after treatment; of 10 trees each treated with 250 gams of crystals, 4 showed a 100% kill of larvæ, and 4 of the others over 90%. Of 3 trees treated with *aldrex* and examined 2—3 months after, all showed over 90% kill. Two trees treated with *dieldrex* showed 95.45% and 100% kill after nearly three months. The 9 adults found in all the trees together were all dead, and over half the pupae were dead. If trees were examined less than two months after treatment it was seldom that more than 50% of larvæ were killed.

The technique of treatment was much the same for all insecticides used, and is adapted to insecticides with a fumigant action. The base of the trunk is shaved away where infestation has been detected, sufficiently to expose the tunnels of the larvæ. The insecticide is then applied; *paradichlorobenzene* is spread around in the form of crystals, and *aldrex* and *dieldrex* are sprayed on as a 10% solution. Coconut husks are then packed round the treated part and then earthed over, so that the husks form under the earth an enclosed fumigation chamber, from which vapour can diffuse slowly into the tunnels. It is therefore important that the earthing up should be maintained in good order for the two or three months necessary to kill *melittomma*. Some variations of this treatment have been tried, but all have proved less successful.

The evidence from these experiments, although promising, was insufficient, and so in October another large scale experiment was set up involving the treatment of 124 trees, on Mahe, and Praslin, with *paradichlorobenzene*, *aldrex*, *dieldrex* and *gammalin*. At the time of going to press 37 of these trees have been examined, and results have been good. Although a full report cannot yet be made, it can be said that *paradichlorobenzene* especially has given very satisfactory results so far; of 19 trees treated 15 showed 100% kill of larvæ, and in all trees only 20 larvæ out of a total of 520 had survived up to the time of examination.

the Rangers and Staff at Grand ' Anse were engaged combatting large fires within a few yards of the plantation boundaries. The response and initiative shown by the forest staff in general during this emergency and their willingness to work day and night when the need arose is very gratifying and augurs well for the future safety of the forests from fire danger.

During these fires a general emergency was proclaimed and all available labour in the vicinity not voluntarily fighting fires, were requisitioned by the law to do so.

This step and the large area involved, plus the loss or damage of several habitations has done a great deal to shake the apathy that previously existed towards voluntarily lending a hand to extinguish fires. After several nights of enforced fighting it was noticeable that turn out to alarms were much smarter — the lesson of "a stitch in time saves nine" having apparently registered with most of the labour involved.

Organisation became vastly improved,— fire fighters were transported where possible by lorries, and outdoor kitchens were started in two of the worst areas to provide food and refreshments, more or less "on site" for the fire fighters.

It is an ill wind which blows no good, and it would seem that the fires have if nothing more, done much to awaken public awareness of fire danger and the need for full co-operation and emergency measures in the very beginning of an outbreak. This in itself must help considerably to restrict the outbreak of fires by carelessness and the early control of those caused otherwise in the future.

## *BUILDING & CONSTRUCTION.*

During the year the following buildings were completed ;—

| Forest | Permanent Buildings. |
|---|---|
| Sans Souci | 1 Senior Forest Ranger's House. |
| Le Niol | 1 Overseer's House |
| Grand Anse | 2 Labourers' House. |
| Newcome (Praslin) | 1 Labourer's House. |

## *UTILIZATION.*

The following produce has been prepared by the Forestry Division during 1952 :—

| Forest | *Albizzia.* | | *Sangdragon.* | | *Eucalyptus.* | | *Santol.* | |
|---|---|---|---|---|---|---|---|---|
| | Plks. | Mad. | Plks. | Mad. | Plks. | Mad. | Plks. | Mad. |
| Sans Souci | 8002 | — | — | — | 429 | — | — | — |
| Le Niol | 3673 | 935 | — | — | 1907 | 1204 | 374 | 934 |
| Grand Anse | 20000 | 3804 | 310 | 1618 | — | — | — | — |

| Forest | *Badamier.* | | *Breadfruit.* | | *Cedar.* | |
|---|---|---|---|---|---|---|
| | Plks. | Mad. | Plks. | Mad. | Plks. | Mad. |
| Sans Souci | — | — | — | — | 3135 | — |
| Le Niol | — | 146 | — | 144 | 1079 | — |
| Grand Anse | — | — | — | — | 1919 | 24 |

The following produce has been prepared by the Forestry Division during 1952 :— (Continued)

*Charcoal (tins)*

| Forest | Cords of wood. | Ordinary. | Capucin. | Cin. Leaves | Lat. Leaves. |
|---|---|---|---|---|---|
| Sans Souci | $337\frac{3}{4}$ | 7553 | 2891 | 48,535 Kgs. | — |
| Le Niol | $64\frac{3}{4}$ | 530 | — | 99,471 „ | 36,508 units. |
| Grand Anse | — | 942 | — | — | — |

SUMMARY.

| | | |
|---|---|---|
| Total running footage of mixed planks | ... | 35,114 running ft |
| Total running footage of mixed madrier | ... | 8,641 „ „ |
| Total running footage of mixed posts | ... | 6,133 „ „ |
| Total number of cords prepared | ... | $402\frac{1}{2}$ cords |
| Total tins of charcoal | ... | 11,916 tins |
| Total units of Latanier leaves | ... | 36,508 leaves |
| Total weight of cinnamon leaves cropped | ... | 148,006 kilos. |

E. F. BREWER,
Forest Officer.

## 3. Agricultural Chemistry and Central Distillery Division.

(a) *Laboratory*

1. *Routine work.*

As during the preceding years, routine work in the laboratory consisted mainly of the examination of produce prior to export and of the examination of samples of fermented liquors submitted by the Excise Department. Various other samples, submitted by the Grand'Anse Estates, Government Departments and the public, and samples of essential oils presented as exhibits at the Agricultural Show, held in Mahé, in September, were also examined.

A total of 749 samples, involving some 3150 determinations, were examined. The corresponding figures for 1950 and 1951 are 545 and 880 samples respectively. The control of the quality of cinnamon leaf oil prior to export was continued and provided the main bulk of the routine work; some 367 samples were examined, one of which was found slightly adulterated with mineral oil. Out of 222 samples of fermented liquors submitted by the Excise Department, 59 were found to be "La Purée", which amounts to 26.5%. The corresponding figures for 1950 and 1951 are 35.9% and 30% respectively.

The work of the Produce Inspector, at the Customs Sheds, continued to be supervised from the Laboratory. Produce coming under the care of the Produce Inspector are :— Copra, cinnamon bark, salt fish and dry patchouli leaves. The main work of the Produce Inspector consists in the control of the quality of copra deposited for export. As in former years, a strict control was maintained ; every lot of copra deposited for export was carefully examined. In all 46 lots, after inspection with assessors, and after examination in the laboratory, were declared unfit for export and were returned to the manufacturers. The usual permits and certificates for copra, essential oils, cinnamon bark, salt fish and dry patchouli leaves were issued.

The inspection of plants and plant parts imported into the Colony, and the issue of import permits, were carried out at the Customs Sheds. The examination of plants or plant parts intended for export, and the issue of covering certificates, were effected in the laboratory.

*2. Research work.*

Due to the absence on overseas leave of the Agricultural Chemist during the major part of the year very little research work was carried out in 1952.

Experimental distillation of cinnamon bark oil, with a view to producing a soluble oil of marketable quality, was continued. The problem to be solved consists in determining what proportion of the first distillates, rich in insoluble terpenes, should be discarded to produce a soluble oil. Following recommendations of The Imperial Institute, scraped cinnamon bark, 3 to 5 years old, was used. Two series of distillation were carried out. In the first the fraction distilled with the first 5% aqueous distillates were discarded ; the fractions condensed with the first 10% aqueous distillates were discarded in this second case. Samples of oil produced in this experiment were sent to the Imperial Institute for examination. At the time of writing no report has yet been received.

A study of the deterioration of copra at different moisture levels, under local storage conditions, was effected. As could well be expected, it was found that low moisture content is essential to the preservation of copra. A maximum content of 7% moisture, the figure previously adopted by this laboratory, was found to be the limit that should be permitted. A determination in weight shrinkage of copra, stored for a relatively long period, was also carried out. Some 500 tons of copra, stored at the Customs Sheds, were weighed at 6 months interval. The shrinkage in weight amounted to 2.12%, which is below the permitted margin of 4.0%.

*(b) Central Distillery.*

During 1952 the Central Distillery was engaged almost exclusively on the distillation of patchouli oil for planters and dealers in essential oils. The other kind of distillation carried out was that of cinnamon bark oil in a series of experiments.

As shown in the table below, the Central Distillery did not have a busy year. This was due to the fall in value of patchouli oil and in the deterioration early in the year of market conditions. From January to March fairly large stocks of patchouli leaves were brought to the distillery for processing. After March, up to July, no stock of leaves were available, and the distillery remained idle. In November a small stock of leaves was brought in, and a fairly large stock in December.

The following table shows the quantities of patchouli leaves and other materials dealt with at the Central Distillery during the last 3 years, as well as the yearly averages of oil obtained per ton of materials: —

| | 1950 | | 1951 | | 1952 | |
|---|---|---|---|---|---|---|
| | Wts. of material in Tons. | Av. Yield of oil in litres per Ton. | Wts. of material in Tons. | Av. Yield of oil in litres per ton. | Wts. of material in Tons. | Av. Yield of oil in litres per ton. |
| Cinnamon leaves | 44.578 | 6.8 | — | — | — | — |
| Patchouli leaves | 38.522 | 49.3 | 58.966 | 51.4 | 20.885 | 51.2 |
| Cinnamon bark | 1.500 | 4.8 | 4.870 | 4.4 | 0.591 | 4.6 |
| Eucalyptus leaves | 1,666 | 14.1 | — | — | — | — |

G. LIONNET,
Agricultural Chemist.

## 4. **Grand' Anse Estates.**

Details concerning the composition of these estates are as follows: —

| Name of Estate. | Area in acres | Date purchased | Land Utilization |
|---|---|---|---|
| Grand'Anse | 1,180 | 1939 | Coconuts, Cinnamon, Foodcrops, Sugarcane, Soil Conservation, Cattle (Sindhi and Local). |
| Souvenir | 200 | 1939 | Vegetables, Fruits, Cattle, Cinnamon. |
| Anse Boileau | 1,032 | 1939 | Coconuts, Cinnamon, Foodcrops, Sugarcane, Soil Conservation, Cattle, (Friesland, Sindhi-Friesland Cross & Local). Pigs. |
| Foret Noire | 928 | 1939 | Coconuts, Cinnamon, Foodcrops, Sugarcane, Soil Conservation, Cattle (Local). |
| Uuion Vale | 240 | 1944 | Experimental Station in Soil Conservation, Pasturage and Dairying. |
| St. Anne Island | 500 | 1948 | Coconuts, Cattle (Friesland-Sindhi Cross breds) under ranching conditions, Large White Pigs. |

One of the major aspects of the policy of the Grand'Anse Estates is to provide improved living conditions for estate personnel in order to secure a settled labour force with all possible amenities for themselves and their families. The Grand' Anse Estates at the same time afford an example in what may be described as a semi Land Settlement Scheme and this year a big step forward has been made to start a Pilot Land Settlement Scheme which will be given in more detail in another section of this report.

During the year a trailer hauled by the 20 H. P. Ferguson Tractor and a lorry were received. They are of very great help in the transport of copra, food crops, and vegetables etc., to Victoria and for general work on the estate as transport of manure, cinnamon leaves to and from the distillery, fuel, etc.

Three fires broke out on the West Grand' Anse Estates between the 13th and 16th October. The first fire which started on Mr. Golby's Estate and carried across the Grand'Anse boundary, burnt about 5 acres. The second one started on Thursday evening at Foret Noire just above the old Beoliere road to Port Glaud. About 20 acres of Government land was burnt. On Wednesday afternoon a fire broke out on Souvenir Estate which burnt 3 labourers' cottages and about 25 acres. Thanks to the help and excellent organisation of fire-fighting squads under the direction of the Forestry Officer, control was quickly established in all cases.

*Coconuts and Copra.*

The following table records comparative yields of coconuts from the estates for the years 1950— 1952 inclusive:-

| *Estates.* | *1950* | *1951* | *1952* |
|---|---|---|---|
| Grand'Anse | 308,988 | 328,536 | 359,530 |
| Anse Boileau | 495,436 | 563,161 | 651,314 |
| Foret Noire | 182,903 | 214,038 | 245,511 |
| Union Vale | 71,178 | 93,910 | 80,531 |
| St. Anne Island | 491,400 | 597,452 | 601,550 |

Also 53,847 coconuts were received from Crown Lands and 51,397 coconuts were sold.

The stock of copra at the beginning of the year was 18.708 tons. A total of 292.159 tons were produced of which 243.929 tons were sent to Long Pier for export, and 39.618 tons converted into oil and poonac.

Continued attention was given to the upkeep of the coconut plantation and supplying replacements and interplanting where neccessary in coconut groves.

*Food Crops and Vegetables.*

The intensive planting of food crops and vegetables was continued following the policy set out during the World War II for maximum food production. The 20 H. P. standard Ferguson Tractor purchased in 1949 has sufferred from mechanical trouble and is now under repair at the P. W. D. This has greatly hindered work on the estates during the last half year.

The cabbage crop has been good this year. Attack of black rot disease of cabbage was insignificant. Beet, carrot and Kol Rabi have been planted on large scale and have given excellent results.

The Wizard simplex oscillators and fans were received during the year and are of great help to cut down the cost of production. A nursery has been made at Grand'Anse Estate where seedlings are grown on sterilized soil and are distributed to the West Coast Grand'Anse Estates and sold to the public.

The following table records production figures of food crops and vegetables for the years 1951 and 1952;—

| Description | Production 1951 | 1952 |
|---|---|---|
| Cassava | 9.258 tons | 8.087 tons |
| Sweet Potatoes | 16.663 ,, | 19.906 ,, |
| Yams | 18.186 ,, | 19.186 ,, |
| Cabbages | 2.361 ,, | 15.495 ,, |
| Maize (cobs) | — | 8,254 units |
| ,, (grains) | 2.186 tons | 1.943 tons |
| Mixed vegetables | 26,448 ,, | 38,938 ,, |
| Fruit, Bananas | 71,359 units | 55,139 units |
| Citrus | 59,826 ,, | 22,944 ,, |
| Pawpaws, Mangoes etc. | 4,991 ,, | 4,125 ,, |

*Cinnamon.*

Cinnamon leaf crop collected and distilled at Grand'Anse distillery was as follows :—

| *Estate* | *Wt. of leaf.* |
|---|---|
| Grand'Anse | 141 tons. |
| Anse Boileau | 45 ,, |
| Foret Noire | 26 ,, = 212 tons. |

The labour for picking cinnamon leaves was very scarce. 1137.9 Kgs. of oils were obtained from the distisllery. A new pump has been ordered but has not yet been received. The brick lining of the boiler is badly damaged and repairs to it are hoped to be finished by the end of January, 1953.

*Sugarcane and Bacca (Fermented Sugarcane Juice)*

The area under sugarcane was maintained and several fields replanted.

The following table shows the quantity of cane milled on the estates for the production of bacca for consumption at the canteens at Grand'Anse and Anse Boileau :—

| | *Tons Cane.* | *Bacca (Bottles)* | *Yield* |
|---|---|---|---|
| Grand'Anse | 83.459 | 53,428 | 640 |
| Anse Boileau | 75.398 | 44,846 | 597 |

Of the bacca milled on the estates 9,237 bottles were supplied to the bacca club in October and November when their mills were not working due to mechanical trouble.

400.5 tons of sugarcane were supplied to the Bacca Club.

*Irrigation and Terracing.*

The irrigation scheme at Foret Noire was completed during the year which enables the irrigation of the Deux Arpents Plateau and the terraces at Pointe Cimetiere.

Another irrigation scheme is to be started early in 1953 to provide water for the irrigation of the terraces at Anse Boileau.

The terracing of poor eroded hillsides was continued at Grand'Anse and started at Foret Noire and Anse Boileau. About 12 acres of land have been terraced during the year. These terraces have been planted under various crops e.g. Cassava, maize, ladies fingers, sugarcane, carrot and kohl rabi, which have given very good yields.

*Land Settlement Scheme.*

A part time settlement scheme has been in operation since 1940 at Grand' Anse, Foret Noir, Anse Boileau and St. Anne Island. This form of settlement required the labourer to work as a wage-earner and at the same time cultivate in his spare time ½ acre of land around or near his cottage.

This year, however, a big step forward has been taken to start a Pilot Settlement Scheme in such a way as to enable men of ability selected from part time holdings, and ex-pioneers with agricultural experience, to become independent and self supporting producers. Six plots of 10 acres each have been surveyed and boundaries marked on Anse Boileau Estates.

A house is being built on each plot and arrangements for piping water supply is in hand.

The cropping of land will be as follows : —

¼ permanently coconuts.

½ foodcrops.

¼ fallow and legume to provide for proper crop rotation.

The marketing of surplus crops over home consumption will be carried out by the Estate.

It is hoped that the selected men will take possession of the land and will start working early in 1953 as soon as the contracts have been signed.

E. MASON,
Development Officer.

### 5. Botanic and Town Gardens

The Botanical Gardens at Mont Fleuri were kept in good condition. Germination of imported flower seeds was poor, and it was rather difficult to establish annuals in beds and borders successfully. The row of Vanda Miss Joaquim Orchids, planted in 1948, flowered profusely during the dry season and provided a nice display of colour.

The hedges and lawns of Government House grounds were kept in perfect trim. Restoration of various sections of the ground was carried out. A number of Albizzia, Sangdragon and other trees, past their prime, were cut down to provide for better conditions for growing flowering and fruit trees, and at the same time for allowing more light and air to the back garden.

The Seychelles College grounds received considerable attention during the year. The grounds were overgrown with bush through lack of maintenance in previous years due to lack of funds. It was possible to do a thorough cleaning of the grounds, and to maintain the two large playing fields in good condition.

### 6. Extension Work and Agricultural Show

The protection of land from soil erosion and the maintenance of soil fertility through mixed farming continued to receive the close attention of officers of the Department. Great emphasis was laid on local food production, and planting material and seeds were supplied to the public. Better upkeep of coconut plantations and the use of all locally available material of fertilizing value were recommended during visits to estates.

In September, an Agricultural Show was held on Gordon Square, in Victoria, and attracted a large number of visitors. It met with great success and afforded an excellent opportunity to assess the progress achieved in agriculture during recent years. The scope of the Show was as wide as possible and included the following classes of exhibits: agricultural products, essential oils, horticulture, forestry products, livestock and livestock products and fishery products.

## SECTION III. Legislation.

The following legislation was enacted during the year: —

Ordinance No. 2 of 1952: An ordinance to amend the Lighting of Fires Restriction Ordinance, 1940.

## SECTION IV. Staff and General.

Mr. J. F. Guy Lionnet, Agricultural Chemist, proceeded to the United Kingdom on overseas leave in March and returned in December. During his leave, Mr. Lionnet was attached for two months to the Rothamsted Experimental Station, Herts, and for one month to a team of soil surveyors of the Soil Survey of England and Wales, mapping the soils of the county of Cambridge.

Mr. D. Morgan returned from his training in Veterinary Science in Mauritius in May, and was appointed Stock Inspector.

Mr. B. Alton was appointed Chief Clerk to the Department in July.

Dr. D. K. Desai, Veterinary Officer, who had been seconded to the Seychelles from the Bombay Veterinary Service, left the Colony in November, after completion of his term of service. This officer gave a great impetus to the development of Animal Industry in the Colony during his short term of service.

Mr. D. Vesey-Fitzgerald, of the International Red Locust Control Service, Mr. E. Brown of the Commonwealth Institute of Entomology and Dr. F. J. Simonds, of the Commonwealth Institute of Biological Control, arrived in February to carry out a programme of research against *Melittomma insulare*, the coconut pest. Dr. Simmonds left in March and Mr. Vesey-Fitzgerald in May. Mr. Brown stayed in the Colony to continue the research work started.

I wish to record my appreciation of the assistance received from the staff and also from members of the planting community. I am grateful also to the local press for giving publicity to the Department's work during the year under review.

F. DUROCHER YVON,

19th March, 1953. Director of Agriculture.